

PATENT

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## **ABSTRACT OF THE DISCLOSURE**

An acoustic sensor, such as a hydrophone, is deployable in a fluidic media having high temperature, high pressure, and/or potentially caustic chemicals. The hydrophone includes a housing filled with an internal fluid and containing a sensing mandrel. The sensing mandrel senses the acoustic pressure transmitted to the internal fluid through a diaphragm. The sensing mandrel preferably includes a polymer tubular mandrel having a coil of optical fiber wound and bonded to its outer surface. The sensing mandrel can be suspended within the housing instead of being rigidly attached thereto. To relieve pressure created by thermal expansion of the internal fluid, the flexible diaphragm, a filler member, a pressure compensator, or combinations thereof can be used. The filler member is mounted in the hydrophone and reduces the amount of internal fluid required in the housing. The compensator may be a bellows or a buffer tube.